PII: S0959-4752(99)00022-5

SUBJECT INDEX

Achievement, individual differences in development 314–320, 381
Achievement strategies, at university 159–177
Activity as context 478–481, 483
Analogical mapping 297
Analogical transfer 254
Applicable knowledge, complex learning 118–128
Argument, construction of mathematical knowledge 511–514, 527–547
Arithmetic
  COPPERS 142
  isometric problem solving 258–267
  problem solving by play 493, 497
Assembly procedures, instructional material 1–18
Astronomical phenomena, impact of teaching on explanations 439–452

Beck's Depression Inventory, university students 163, 165
Beliefs, epistemological 97–116
  terminology 107
Blind training 40

CAME I and II 389, 390
Capacity, cognitive development 293, 300, 380
Cartoon-Attribution-Strategy Test, university students 163–167, 175
Chunking 294, 295, 381
Classroom
  mathematical knowledge through discussion 503–525
  social construction of science lessons 195–212
Co-development 284
Cognitive development
  early symbolization, educational implications 325–338
  early understanding of numbers 341–374
  educationally relevent science 387–392
  individual differences in theoretical models 309–322
  learning, analogy and capacity 289–306
  new trends 375–384
  nooplasis 271–286
  social context, mathematics 561
Cognitive holding power 396
Cognitive Holding Power Questionnaire, performance in schools 393, 398–410
Cognitive load theory 3
  assembly procedures 6
Cognitive strategies 160
Cognitive structure, meaning 476
Cognitive Training for Children(CTC), effectiveness, meta-evaluation 411–434
Coherence textual changes 216, 219–228
Collective activity, mathematics learning 489–500, 503–526
Collective argument, mathematics learning 527–547
Colligation, history 135
Coloured Progressive Matrices(CPM) 415, 421, 422, 430, 431
Complex learning, instructional effects 117–129
Complexity of concepts 290, 294, 295
Comprehension
  scientific prose 215–233
  self-regulatory strategies 37
Computer program comprehension 21
Computer simulation, assembly procedures 7
Conceptions, knowledge and beliefs, epistemological frameworks 97–116
Conceptual complexity 290, 294, 295
Conceptual models, word-processing 20–35
Constructivism, constrained 285
Context 469–472
  activity as 478–481, 483
  cognitive structure 476
  development 485
  mathematical knowledge through whole-class discussion 503–525
  mathematical learning in collective activity 489–500
  mathematical learning, social valorization 567–571
  mathematical learning through collective argument 527–547
  meaning 475, 550–558
  situated cognition 550–558
  situation as social surrounding 476
  social, mathematics, cognitive development 561–565
Contextualizing 481–485
  socialization of argument, mathematics classroom 530

PII: S0959-4752(99)00022-5

SUBJECT INDEX

Achievement, individual differences in development 314–320, 381
Achievement strategies, at university 159–177
Activity as context 478–481, 483
Analogical mapping 297
Analogical transfer 254
Applicable knowledge, complex learning 118–128
Argument, construction of mathematical knowledge 511–514, 527–547
Arithmetic
  COPPERS 142
  isometric problem solving 258–267
  problem solving by play 493, 497
Assembly procedures, instructional material 1–18
Astronomical phenomena, impact of teaching on explanations 439–452

Beck's Depression Inventory, university students 163, 165
Beliefs, epistemological 97–116
  terminology 107
Blind training 40

CAME I and II 389, 390
Capacity, cognitive development 293, 300, 380
Cartoon-Attribution-Strategy Test, university students 163–167, 175
Chunking 294, 295, 381
Classroom
  mathematical knowledge through discussion 503–525
  social construction of science lessons 195–212
Co-development 284
Cognitive development
  early symbolization, educational implications 325–338
  early understanding of numbers 341–374
  educationally relevent science 387–392
  individual differences in theoretical models 309–322
  learning, analogy and capacity 289–306
  new trends 375–384
  nooplasis 271–286
  social context, mathematics 561
Cognitive holding power 396
Cognitive Holding Power Questionnaire, performance in schools 393, 398–410
Cognitive load theory 3
  assembly procedures 6
Cognitive strategies 160
Cognitive structure, meaning 476
Cognitive Training for Children(CTC), effectiveness, meta-evaluation 411–434
Coherence textual changes 216, 219–228
Collective activity, mathematics learning 489–500, 503–526
Collective argument, mathematics learning 527–547
Colligation, history 135
Coloured Progressive Matrices(CPM) 415, 421, 422, 430, 431
Complex learning, instructional effects 117–129
Complexity of concepts 290, 294, 295
Comprehension
  scientific prose 215–233
  self-regulatory strategies 37
Computer program comprehension 21
Computer simulation, assembly procedures 7
Conceptions, knowledge and beliefs, epistemological frameworks 97–116
Conceptual complexity 290, 294, 295
Conceptual models, word-processing 20–35
Constructivism, constrained 285
Context 469–472
  activity as 478–481, 483
  cognitive structure 476
  development 485
  mathematical knowledge through whole-class discussion 503–525
  mathematical learning in collective activity 489–500
  mathematical learning, social valorization 567–571
  mathematical learning through collective argument 527–547
  meaning 475, 550–558
  situated cognition 550–558
  situation as social surrounding 476
  social, mathematics, cognitive development 561–565
Contextualizing 481–485
  socialization of argument, mathematics classroom 530

Cooperative learning
improving text comprehension strategies 66–79
procedural knowledge for reading comprehension 37–61
COPPERS 142–156
Counting principles 342, 345–363
Cultural activities, as context 478–481
Cultural historical activity theory 470, 482
Culture, conceptions of knowledge and beliefs 97–116
Culture Fair Test(CFT1) 419, 421, 423, 427, 430, 431

Decontextualization 482, 483
Deep approach to text reading 84
Defensive-pessimistic strategy 160, 167, 173–175
Definitional knowledge, simulation-based learning 241, 242, 244
Delayed recall, training 192
DenkMit 424
Depression, university students 165
Development, contextualizing 485
Developmental cognitive science
early symbolization, educational implications 325–338
early understanding of numbers 341–374
individual differences in theoretical models 309–322
learning, analogy and capacity 289–306
new trends 375–384
nooplasis 271–286
use with students in school 387–392
Dimensionality of representations 291
Discourse analysis, argument in mathematics classroom 529
Discovery learning 236
Discussion orchestration 531–547, 563
Domain-general learning 281, 378, 379
Domain-specific learning 281, 378, 379, 473, 474
Dualism 98

Epistemological beliefs, students and teachers 97–116
Error Detection Task 69, 72, 73, 76
Explanations, personalisation in history 135

Far transfer 395
FEW 428, 429, 432
Fluid intelligence 412, 415–434
Foreign-language vocabulary 179–194
Fractions 343, 363–370
Frame, socialisation of argumentation, mathematics classroom 530
Frostig Developmental Program of Visual Perception 423, 428

Geography, symbols in education 335
Gestalt theory 477
Gifted students, America and Singapore, knowledge and beliefs 99, 100
Graphical representation
situated meanings and logical coherence 554–558
teaching assembly procedures 1–18
Guided participation 38

Hannover Wechsler Intelligenztest für das Vorschulalter(HAWIVA) 427
Hierarchical linear modelling, keyboard strategy in foreign language learning 182, 187
Higher education
experience of learning mathematics 455–467
text-reading and variation in understanding 83–95
History, personalisation 131–139
Hypercognitive system 274, 282, 379
Hyperlearning 281, 282
Hypothesis-Experiment-Instruction 506, 524

Illusory glow optimism 161, 173
Individual differences, cognitive development 304, 309–322, 381
Inductive reasoning, Cognitive Training for Children 411, 412, 415–434
Instructional design, cognitive load 3
Instructional effects, complex learning 117–129
Instructional text, word-processing, improving understanding 19–35
Intelligence
Cognitive Training for Children 412, 415–434
individual differences in development 311–322
Interactive learning, mathematics 489–500, 503–525, 527–547, 549–558, 561–565, 567–571
Intuitive knowledge, simulation-based learning 238, 241, 245
Isometric drawing 1, 7–17
Isometric problem solving, micro-genetic learning 253–267

Japan, mathematics learning thbrough whole-class discussion 523
Jeans Factory 121

Keyword strategy, foreign language learning 179–194
Knowledge
applicable 118
construction through discussion 503–525

epistemological beliefs 97–116
terminology 105
Kognitiver Fähigkeitstest (KFT) 416, 420, 422, 425, 430, 431

Laboratory work, social construction of science lesson 195–212
Language comprehension strategies 64, 65
Learned helplessness 160
Learning
cognitive development 289–306
complex 117–129
individual differences 309–322, 381
model 457
spatial representations 1–18
Learning disabled children, improving text comprehension strategies 63, 67–81
Learning environments
Cognitive Holding Power Questionnaire 393–408
COPPERS 142–156
hierarchical and multi-system minds 281
Jeans Factory 121
simulation-based 235–250
Learning in context 471, 477
mathematics 474, 561–566
collective activity 489–500
collective argument 527–547
logic of meanings and situated cognition 549–558
social valorisation 567–571
whole class discussion 503–525
Learning strategies 155
Listening comprehension, improving strategies 63–81
Listening Comprehension Test 69, 72, 73, 77
Logic 275, 379
Logic of meanings 550
LOGIC project 311
Logico-mathematical knowledge 550

Manipulations, mathematics education 334
Maps 335, 382
Mathematics
differential development of achievement 314–320
early understanding of numbers 341–374, 388–391
experiences of learning at university 455–467
isometric problem solving 256–267
learning in context 471, 474, 561–565
collective activity 489–500
collective argument 527–547
logic of meanings and situated cognition 549–558
social valorisation 567–571
whole class discussion 503–526
manipulations 334
multiple solutions, COPPERS 141–157
Meaning
context 475–477
logico-mathematical knowledge 550–558
Memory
capacity, cognitive development 293, 380
individual differences in development 311–314, 320, 381
Mental architecture 272
Mental models 118
astronomy 440–442
word-processing system 20
Mentalisation, history 133
Meta-evaluation, Cognitive Training for Children 411–434
Mexico, cooperative learning 41–61
Micro-genetic learning, isometric problem solving 253–267
Mind, postulates about formation 271–286, 376
Models, symbolic development 328–332, 382
educational implications 333–338
Model-based instruction
assembly procedures 3, 7, 8–17
word-processing systems 21
Modular learning 281, 282
Multiple learning contexts, applicable knowledge 119–128
Multiple solutions, primary mathematics 141–156

Narrative texts, comprehension, cooperative learning 42, 43, 48
National Council of Teachers of Mathematics(NCTM) Standards 528
Nooplasis 271–286
Numbers, early understanding 341–374, 388, 391
Numergraphs 366
Numerlog ordering study 365

One-Minute Test 68, 72
Optimistic strategy, university students 160, 164, 167, 173, 174
Orthographic drawing 1, 8–17
cognitive load 3, 6

Parallel distributed processing modelling(PDP) 289, 292, 299, 300, 376, 379
Particularisation of meanings 475, 477, 480, 484
Personalisation, history 131–139
Phenomenographic approach to learning 478
Pictured information, symbolic development 327–332, 382
educational implications 333–338

Play, learning in 491–500
Prediction performance, complex learning 124, 126
Previous knowledge, comprehension of scientific text 223
Prior understanding, experiences of learning mathematics 456, 461
Problem solving, isometric, micro-genetic learning 253–267
Problem solving guidance, applicable knowledge 120–128
Procedural knowledge 394
  cooperative learning and appropriation of 37–61
Proportional reasoning, situated meanings 551–558
Propositional knowledge test, simulation-based learning 241, 242, 246

QUASAR project 533
Questioning, text comprehension strategies 66

Reading comprehension
  higher education students 83–95
  improving strategies 63–81
  procedural knowledge, cooperative learning 37–61
Reading Comprehension Questionnaire 69, 72, 76
Reading Comprehension Test 68, 72, 76
Reading difficulties 64
Reasoning 297
  situated meanings 551–558
Reciprocal teaching, improving text comprehension strategies 40, 66–79
Relativism 98
Retrieval, training 192
Revoicing 531
Rhetorical analysis, socialisation of argument 531
Rosenberg's Self-Esteem Scale, university students 163, 165
Rote-probed counting 345, 349

Scaffolding 38
Schematization, isometric problem solving 254
SCHOLASTIC project 311, 315
School careers, science classroom 195, 207
Science
  social construction of lesson 195–212
  specific speech genre 440
  teaching and explanations of astronomical phenomena 444–452
Scientific prose, levels of comprehension 215–233
Secondary schools, Cognitive Holding Power Questionnaire 393–410
Segmentation 296, 381
Self-awareness 274, 279
Self-esteem, cognitive strategies 161, 165, 174
Self-handicapping strategy, achievement at university 160, 169, 170, 173, 174
Self-learning 267
Self-regulation 274, 279
Self-regulatory strategies, reading comprehension 37
  intervention procedures 39
Semiotic activity 485
Sesame Street 333, 382
SETCOM 240
Settings, cognitive holding power 396
Signs, meaning 475
Simulation-based learning 235–250
  assessment of results 237
  assignments 240, 247
  model progression 239, 240
  WHAT-IF test 241–250
Singapore, conceptions of knowledge and beliefs 97–116
Situated cognition 377, 549
  logical coherence in graphical representation 554
  proportional reasoning 551
Situated/informed training, self-regulatory strategies 40
Situated learning 473, 474, 477
Situation model, comprehension 216, 217, 227
SMISLE 239
Social construction of science lessons 195–212
Social situation, learning 477
Social valorisation, mathematics learning 570
Sociocultural contexts, mathematics learning 561–565
  collective activity 489–500
  collective argument 527–547
  logic of meanings and situated cognition 550–558
  social valorisation 570
  whole class discussion 503–526
Socio-instructional approach 40
Sociolinguistics, argumentation 529
Spatial representations, children's learning 1–18
Specialised capacity spheres 273, 275, 279–286, 378, 379
Strategic knowledge, development during play 498
Strategic Listening Test 69, 72, 75
Strategic Reading Test 69, 72, 73, 75
Strategies
  achievement, university students 159–177
  development 299
  keyword, foreign language learning 179–194
  primary mathematics 155
  self-regulatory, comprehending and learning 37, 39
  spatial learning 13

text comprehension, training 63–81
Strategy Attribution Questionnaire, university students 163–165
Student-student interaction
mathematics learning 504
science classroom 195–212
Successor principle 342, 344–363
Surface approach to text reading 84
Symbolic development 325–338, 382
Symbolic social mediation 570

Teachers
epistemological beliefs 100
thinking in school settings 397, 404–406
Teaching, impact on explanations of astronomical phenomena 439–452
Text
comprehension and learning, cooperation 37–61
comprehension strategies in reading and listening studies 63–81
reading and variation in understanding 83–95
science, comprehension 215–233
Thinking
Cognitive Holding Power Questionnaire 393–410
Cognitive Training for Children 411–434
impact of education 440
Three-dimensional mental representation 4
Total Processing Space 294
Transfer, Cognitive Training for Children 425, 428
Transfer test, mathematical knowledge, whole class discussion 518
Transitive inference 297, 379
Treasure Hunt 490

Understanding
variation, higher education students 83–95
word-processing manuals 19–35
United States, conceptions of knowledge and beliefs 97–116
University
achievement strategies 159–177
experiences of learning mathematics 455–467

Vocabulary acquisition strategies 179–194

Well-being, university students 170, 174
WHAT-IF test 241–250
Whole class discussion, construction of mathematics knowledge 505–525
Wide Range Achievement Test(WRAT) in arithmetic 492
Word identification 64
Word problem, whole class discussion 506–525
Word-processing manual, improving understandability 19–35
Working memory 294

Printed and bound in Great Britain by Nuffield Press Ltd